

An
Inaugural Dissertation

On
The Typhoid Fever of Amelia City, Va.
in the years of 1827-8

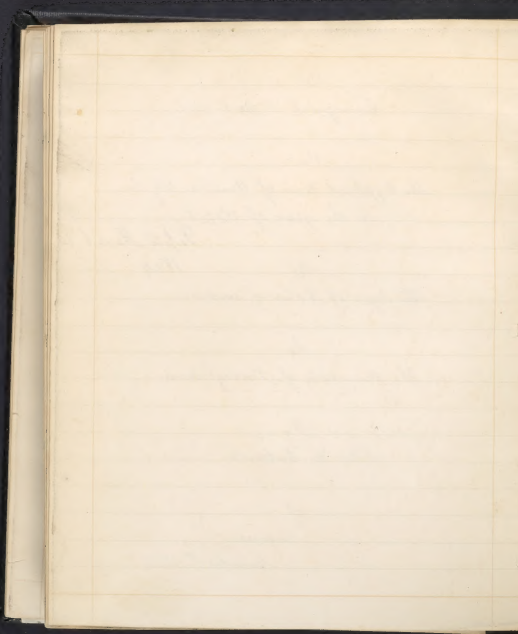
Read March 10
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For
The degree of Doctor of medicine

In
The University of Pennsylvania

By
Peter H. Anderson

of
Virginia
November 1st 1828



To

Nathaniel Chapman, M.D.

Professor of the Institutes and Practice of Medicine
and of Clinical Practice in the University
of Pennsylvania

Dear Sir,

Deeply cherishing the sentiments of esteem awakened by your public lectures, your friendly admonitions, exemplary conduct and persevering industry, I embrace, with eagerness, the opportunity offered, of rendering unto you, my warmest thanks. In your steady friendship towards me, since I have had the honour of being your private pupil, for the difficulties which you removed by your private instructions, for admiration of your talents, and esteem for your virtues, permit me to dedicate to you, the following sheets, as a small and grateful tribute, to your splendid

abilities, and private worth, and to hope, that
you may long enjoy an illustrious and happy
life, and long remain an incentive to indus-
try to the physicians of America.

Your obedient servant,
and obliged friend
P. Henderson

To

Joseph B Anderson, M.D.

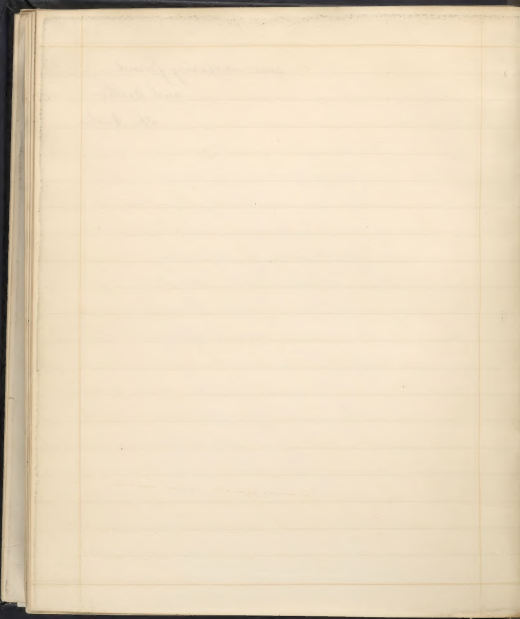
Dear Sir,

The connection existing between us, forbids the free expression of my feelings; yet, I should neither be just to myself, nor stand acquitted of my duty to you, were I to neglect the present opportunity of expressing the deep gratitude, which I feel towards you for the many advantages enjoyed, through your hands, in the commencement of my studies; for your confidence in me, manifested in permitting me to assist you in your practice, especially during the prevalence of the late epidemic; also for many useful suggestions respecting its nature and treatment.

That you may be blessed with longevity, and prosperity, is the sincere wish of

Dear Sir

your unceasing friend,
and Brother
The Author



(11)

Sanitary Description

*On the Hygienic State of Amelia City &c
in the year 1878*

Previous to entering into the history of this disease, it is necessary to make a few remarks respecting the local situation of this County the seasons and state of health of the inhabitants for some months prior to its commencement.

Amelia County throughout is hilly and intersected by numerous valleys and large swamps, through the centre of which pass small currents, which at certain places spread to so considerable a width, as to convert large portions of them into marshes. In their natural state, they contain little, or no stagnant water, but have



2.
a free outlet, hence the removal of the wa-
ter before it becomes stagnant. It is follow-
ed, however, immediately by a fresh sup-
ply, thus keeping them constantly inun-
dated.

With respect to the seasons and
health of the inhabitants. The fall of 1896
was as healthy as usual for the season. There
were a few cases of ~~Influenza~~ Bilious Fever,
which readily gave way on the approach of
winter, and from that time, until the com-
mencement of the fever under consideration,
the inhabitants continued healthy. The win-
ter had been very moderate, the spring was
rather forward, remarkably calm, and sea-
sonable throughout. Vegetation of every
description advanced with unusual rapid-
ity, until the 1st of June, when the wea-
ther became very dry and continued so,



until 15th of July; when a violent gust,
accompanied with immense torrents of
rain, occurred. The quantity of rain, which
fell, within the space of a few hours,
is almost incredible. Streams of every
description over flowed to an unusual
extent. The strongest milldams being
insufficient to withstand their violence,
were rent asunder, and the most of the
county was deluged. Many of the dams
were unrepaired; and the ponds, which
were saturated with water exposed to
the rays of the sun, consequently, vege-
table matter, which had been accumu-
lating for several years was speedily
decomposed.

After the cessation of the storm,
the weather was extremely warm. The
Thermometer ranged between 95 and 98 de

gress of Stahenheit. Not more than eight or ten days had elapsed, before the Typhoid Fever commenced.

By the 1 of August it had made rapid progress, and continued throughout the autumn with little or no abatement. On the approach of winter, though in some degree checked, yet, it was not arrested. In the beginning of the ensuing spring and summer, it broke out with great violence. At the close of summer, however, it gradually gave way, after having continued upwards of twelve months.

There was much diversity of opinion respecting its precise nature, as well as the best mode of treatment. By some it was pronounced to be genuine Typhus; by others to be of a nature intermediate between Ty-



nocha and synecchus; they consequently called it Typhoid. The latter opinion was adopted by our most intelligent practitioners. I have always believed with Dr Chapman, that genuine Typhus is the result of crowded & badly ventilated places.

The most remarkable feature of this disease, was its continuance throughout winter. The prevalence of fevers in this County during the autumnal season, is exceedingly common. But no sooner does winter set in, than they cease.

Another feature, no less remarkable was the feeble effect of remedial agents, in arresting its progress, when fully formed.

Although the disease was obstinate and tedious, very few cases proved fatal.

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Sal., unless from neglect or mismanagement, under such circumstances its mortality was great.

The disease was marked by three distinct stages, each of which had its peculiar symptoms.

The first stage, commenced with nausea, and some degree of vomiting, which was soon followed by languor, listlessness, and disinclination to motion, a palid face with contracted features, coldness of the surface, particularly of the extremities, a frequent, small, and incompressible pulse; a sense of fullness in the head, particularly about the frontal protuberances. These symptoms after continuing two or three hours, were followed by a chill, which was slight and of short duration.



tion; leaving the patient in a comfortable situation, so much so that he fancied himself well. Unless, however, appropriate remedies were used, a repetition of the chill, generally occurred about the seventh day, which rendered all his hopes delusive. During the interval, the patient remained in a state approaching so near the healthy, as to deceive an ordinary observer. The strength was little impaired, the spirits good, the sensations and excretions natural. But upon a minute investigation, the pulse was found more frequent and smaller than natural, the skin rather cold, the venous circulation languid, and a slight uneasiness was felt over the region of the liver, on pressure, evidently indicating that congestion was already forming. This stage continued ten or twelve



days, before fever was fully developed.

^{2nd} stage. It was in this stage, that the true character of the disease was manifested. There was much gas trick distress, with frequent retchings accompanied with ejections of small quantities of thick bile, of a dark yellow colour, and frequently of a greenish cast; tenderness of the epigastrium on pressure, fullness in the region of the liver, a sense of internal heat, particularly of the stomach, a recession of blood from the surface, the pulse was small, frequent, and corded. At this time, some one of the abdominal viscera, most frequently the liver, was congested. The disease continuing longer, there were determinations

to the head, accompanied with delirium, and subultus tendinum. The tongue throughout this stage was dry, encrested in the centre, and florid at the tips and edges. At other times it was entirely clean, and of a deep scarlet colour, with the papillae considerably elevated. The eyes somewhat glassy and insensible to light. The vessels of the conjunctiva were injected. There was also contraction of the levator and depressor muscles of the lips, so as to present a quivering appearance. Frequently while the extremities were unusually cold, there was at the same time, inordinate heat of the whole body. Blood drawn at this period, was of a dark colour, and so thick as to escape but slowly from a large



orifice. It speedily formed a firm coagulum, and readily separated into crasamentum and serum. The crasamentum contracted into a firm and small bulb. I have seen blood drawn in vessels six or eight inches in diameter, in which was soon formed a coagulum not more than two or three inches in diameter; and of so firm a consistence, that it could easily be suspended on the end of a probe. its surface was covered with a buffy coat. The urine was scanty and high coloured. The alvine evacuations were thin and watery, and of a whitish appearance. This stage usually continued eight or ten weeks.

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3 stage. This stage was marked by great derangement of the brain;

delirium, low and muttering, subcillus tendinum, great muscular weakness, syncope animi when raised in the erect position, laborious respiration, attended with heaving of the shoulders, and impaired sensibility. The remedies administered produced no apparent effect. The application of sinapisms and blisters was not followed by vesication. The discharges from the bowels were very solid and dark. The pulse was frequent, small, and compressible. This stage seldom continued more than four or five days.

Causes. From what has been said respecting the seasons &c, it is evident that the disease was owing to the action of heat and moisture on vegetable matter. To render it more

evident. I will mention some striking examples.

Heat, though essential, was not alone, sufficient to produce it. Our hottest seasons, when dry, are healthy.

Lind states that the dry season in Senegal, the hottest part of the year in that country, is healthy. In tropical countries, the hot and dry seasons are healthy; but soon after the rains commence, they become sickly. Lind speaking of Guinea says this as most tropical countries, has, properly speaking, only two seasons, the wet and the dry. The first is commonly of about four months continuance, and is the season of sickness, whereas for many months in the dry season, most parts of this country are equally healthy and pleasant.



with any in the world. No sooner, however, do the rains set in, than the ravages of disease commence, and continue throughout the wet season, and afterwards, until the superabundant moisture be evaporated. As soon as this is effected, the health of the country is restored, except in those places, which continue wet throughout the year. Moisture then was also necessary to its production.

Heat and moisture, though both essential, were not sufficient to produce it. Many instances are mentioned of vessels in port, immediately on the commencement of disease among their crew pushing out to sea with the effect of immediately arresting its progress. In the immense swamps

is the south before the forests are cut down, there is little or no sickness, even in the hottest months, and instances have often occurred of a fever being checked by the superabundance of moisture.

Thus, a bilious fever was arrested in Brabant by inundating a neighbouring marsh; and Mr John Rungt tells us, that the inhabitants of Brera adopted the same expedient with success. Excessive rains have produced the same effect. Something more than heat and moisture, then, was necessary: this additional circumstance is easily discovered, by bearing in mind the immediate appearance of the disease, after the storm, the condition of the drained millponds, and the heat of the weather, immediately succeeding.

On the other hand places formerly unhealthy on account of a neighbouring marsh, have been rendered healthy by draining it. Without entering into any lengthened detail, I will relate a circumstance, which fell under my own observation and goes far to prove the correctness of the above proposition. Mr. G. a respectable farmer, residing in the western part of America lately, for several years had scarcely known disease in his family. His house was situated on an elevated spot, where the air had always been pure and refreshing. There was no stream of magnitude within less than four or five miles of his residence. There was, however, a large swamp extending



through his plantations, having a current in the middle passing by the foot of the hill on which his house stood; at which place it was unusually wide and formed one of those marshes which are so common to the south. The water however, was not stagnant. In the fall of 1822 he commenced draining it. But the greater part abounded with springs, which did not afford a sufficient quantity of water to form a stream yet, moisture enough to cause the decomposition of vast quantities of vegetable matter, which had been accumulating for many years. On the approach of the succeeding spring and summer, the health, which his family had usually enjoyed, was supplanted by fevers

of the most malignant character. The attending physician, who was remarkable for his intelligence, immediately discovered their source, and advised the ly- of the necessity of either draining it entirely, or filling his former drains. After many fruitless attempts to render it dry, he, at length allowed the stream to assume its former rout; and the health of his family was completely restored.

It is proper to observe, that the continuance of the disease throughout the winter, is not an objection to its dependence on heat and moisture co-operating on vegetable matter. On this point it is, only necessary to observe, that the internal change produced by mi-

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asmata, often exist for a length of
time, without exciting fever. Dr.
Chapman, speaking of the causes of
Intermittent Fever, observes, that the
length of time, after an exposure
to it, before its effects are mani-
fested is uncertain. I have known
it lie dormant for several
weeks and even months.

Diagnosis. The first stage was
more liable to be confounded with
Intermittent Fever, than any other
disease. But by careful attention to
the case, the distinction was sufficient-
ly obvious. In Intermittents the apy-
rexia is generally complete, leaving no
disturbance of circulation. Though oc-
casionally irregular, yet, for the most
part, then takes on either the type



In the second stage, the patient is more or less
 in the third stage, rather the first, as
 the sweating stage was well marked.
 The pulse continued to rise, and
 until the approach of the suc-
 ceeding chill. Neither the action nor any
 other form of Intermitents was initiated.
 The second chill came on about the
 seventh day, and was frequently follow-
 ed by a third, in a day or two. The
 furred tongue, which is so common an
 attendant of Intermitents, was absent.

In the second and third stages, it
 was so clearly marked as not to be
 mistaken.

Prognosis. The termination
 of the disease was generally favour-
 able, when the efficaciousness of quinine
 did not change its character. Having

reached the second stage. Its progress could not be arrested. Irritability of stomach; heavy stupor; low muttering with delirium; singultus, vomiting dark matter, coldness of the tongue and breath, imperfect respiration attended with heaving of the shoulders; humidity and inelasticity of skin; haggardness of countenance; ineffectualness of remedial agents; and the supine and extended position were unfavourable symptoms. On the other hand, subsidence of the symptoms; equilibrium of temperature; return of warmth, subsidence of delirium, dejection of dark offensive matter, and ability to resume the curved position, were favourable.

Post Mortem. The mucous and



peritoneal coat of the stomach were
inflamed, the latter chiefly about its cur-
vatures. The omenta were phlogosed,
particularly the omentum minus. The
muscular coat was seldom diseased.
The lungs often presented an unnat-
ural appearance. In their anterior
part, ⁱⁿ some cases considerable por-
tions somewhat resembled the liver,
both in appearance and weight. The
liver and spleen were phlogosed, the
membrane on the posterior surface of
the liver, particularly about the Ve-
lulus singularis, the cellular substance
surrounding the hepatic duct, artery and
vena portarum, were always more or
less inflamed. Sometimes also the
brain was congested, and the arach-
noid membrane phlogosed.

Pathology reveals to us three sets of vessels mainly related in fever, viz. the arteries, veins and capillaries, of these the two first are mutually dependent; the last have somewhat an independent action; they are all, however, governed by the same laws, and influenced by the same causes; but in different degrees according to their power of action, or the irritability with which they are endowed. We therefore find that although all are affected, they still suffer in different degrees: as an instance, let us take the cold stage of intermittent fever; here we find the capillaries completely involved, the veins sluggish and the arteries less affected than all, the same condition

occurs in the disease of which I am
treating. Believing misassimilation to be
the chief cause of this derangement
let us investigate its effects. If we
view its first interference in the sys-
tem, from the commencement of an
attack of jaundice to its most aggravated
form, we will find that it exerts
such a powerful influence as to pro-
duce a paralysis of, I may so term it,
of the bloodvessels, robbing them of
their power of action and inducing
that state of congestion to which we
refer in this disease. All the symp-
toms indicate this. What causes that
torpor and debility which renders
in the disease, what causes that
sluggishness and inactivity in the co-
pularies, and the consequent coldness

of the skin & the causes that par-
 ticular state of the stomach which
 post mortem examinations reveal.
 The answer to all these is plain
 & simple. Languor, anæmia, frequent
 the concentrated power of miasmata
 invading the system in its most
 susceptible part by various influence pa-
 ralyses the blood vessels. The vis medi-
 catrix natura of bottles, or some in-
 explicable cause endeavours to arouse
 the system by exciting vascular action,
 but stunned as it were, by the in-
 stant attack, only one set of vessels
 (the arteries) recover their action,
 and these only partially. The veins and
 apertures, therefore, become the recepta-
 cles of blood, and that state of con-
 gestion ensues which I have noticed

and which, according to the laws of the animal economy, attacks those parts with the greatest force where the cause first acted. a loss of balance is therefore produced in vascular action, the system sinks under the impression, and the whole train of symptoms ensue.

Treatment. In the first stage, practitioners differed, as to the propriety of bloodletting, which arose chiefly from their confounding the oppressed, with the weak pulse. Experience, however, proved that bleeding, even in large quantities produced the most salutary effects. I have seen twenty or twenty five ounces drawn at a single bleeding. Nor was a smaller quantity sufficient to make a decided impression on the system, unless carried

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The blood to that extent it was altogether in-
sufficient. A full bleeding was followed
by a slower and fuller pulse; the capil-
lary circulation immediately took on its
healthy function, and the surface resumed
its natural colour and warmth, evidently in-
dicating the restoration of the lost balance
of the circulation, which seemed to be
the chief cause of the disease. After
bleeding an emetic of tartarized Antimony
was given. If it was administered previ-
ous to the abstraction of blood, the pa-
tient experienced pain in some one of
the abdominal viscera, most frequently of
the liver. When this occurred, the disease
always proved obstinate. An emetic, how-
ever, given after bleeding, was found to
be the most appropriate remedy. It was
followed by the ejection of a large

quantity of bile, of a yellow or greenish
 cast; the capillaries, were raised from their
 inactive state and the surface was cover-
 ed with a gentle perspiration, leaving
 the patient in a languid state which
 generally terminated in sleep. In two
 or three hours after the administration
 of the emetic, twelve or fifteen grains
 of calomel was given, and to ensure
 its operation it was followed by a
 large spoon-ful of Castor Oil, which
 usually in four or five hours produced
 copious evacuations of dark and often
 viscid matter from the bowels. This
 with a strict avoidance of exposure
 and improper diet; was all this stage
 required. All the cases taken in this
 stage and treated, as I have mention-
 ed, readily gave way, and was fol-

lowed by a speedy recovery. But when from neglect or mismanagement, the disease was suffered to run into the second stage it was impossible to check its course. Nature left to herself was far more efficient, than when interrupted by rash treatment. Contrary opinions, however, were entertained by some practitioners; and they accordingly set in upon the disease, in this stage, with a bold and precipitate hand, as though it was in the forming stage.

They were, however, taught by sad experience (for two-thirds of the unhappy patients subjected to such treatment died) that, after the disease had reached this stage, it was a mild and palliative treatment, alone, that was attended with success. It would be

easy to give, many interesting details on this point; which, however, would be a digression from the narrow compass of an essay like this. It will, therefore, detail the treatment that fell under my observation, as well as the result, in as concise a manner as possible. The principal remedies relied on, were, general and local bleeding, purgatives, diaphoretics, and vesicatories. Irritability of stomach, attended with a sensation of internal heat; tenderness of the epigastrium on pressure, a tongue foul in the centre and florid at the tip and edges, excluded the use of emetics. Bleeding required great caution.

The indications for its use were the corded pulse, difficulty of breathing, restlessness, and a dry skin. Under such



circumstances, it was followed by a removal of these symptoms, as well as a more equal distribution of blood.

The quantity taken was regulated by the effect produced, that is, it was drawn until a decided impression was made on the system. In most cases ten or twelve ounces induced a state approaching to syncope. Nor was a single

bleeding sufficient; repetition was required, which was regulated by the effect produced, and the appearance of the blood taken. When it did not induce exhaustion and when the blood speedily coagulated into a firm mass, having the surface covered with a buffy coat, repetition was required.

After general bleeding had been carried to a sufficient extent, cups were



applied immediately over the seat of
congestion, followed by a large blister.

Calomel was of great utility, the
mildest purgative, was most beneficial
except in those cases, where the
bilious secretion was interrupted, or
when the contents of the intestines
could not be so effectively resisted
the action of mild purgatives, when
such circumstances obtained, was given
in the dose of two or three grains
repeated every two hours, until twelve
or fourteen grains were taken, and
followed by a large spoonful of castor
oil, which created freely issuing co-
pious discharges of bilious and offen-
sive matter, from the bowels. Calomel
given in the dose of ten or twelve

gums secreted by an ounce of castor oil, was also extremely beneficial.

When it was required to keep the bowels in a soluble state the sulphate of soda in the dose of one or two grains with the addition of one sixth of a grain of tartar emetic repeated every two or three hours was much used. Cold injections were also of great utility.

Laxatives were administered after the system was properly reduced. Nuxvomica in the dose of eight or ten grains, with the addition of the tenth or twelfth of a grain of tart emetic, and combinations of Senna and Opium, were principally used. The former was given, when it was required



to keep the bowels in a soluble state, and at the same time to produce a slight action of the skin. To render diaphoresis more certain, warm pediluvium, or the vapour bath, was used at the same time. when there was restlessness and anxiety, which arose from mere irritability, Rubr. Ipecac. Campi was generally given. While it allayed irritation, it produced a gentle diaphoresis. But at the same time, other symptoms demanded attention. when there were great determinations to the head, cups were applied to the temples, followed by cold applications; while at the same time the extremities were immersed in warm water. In severe cases, a blister was

applied to the head, and sinapism
to the extremities.

For the relief of the irritable
stomach, cups were applied to the
epigastric region, followed by cold
applications, and a large blister to
the same part. Cold drinks, such
as ice water or lemonade, in very
small quantities at a time, were also
given.

The diet consisted chiefly of
rice, panado, or rice-water. Balm tea, or
apple water was used as drinks.

The success of this treatment
was great. Of those who were subject
ed to it, not more than one in fif-
ty died.

As to the treatment in the
third stage. I cannot speak from

experience. The indication was obviously to give strength to the system. The most appropriate remedies, were, carbonate of ammonia, wine whey; Infusion of bark alone, or conjoined with *Serpentaria*, sinapisms to the extremities, and a nourishing diet.

Finis

